

NEW CLAIMS 21-50

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21. Process which comprises: coating substrates with a polar coating, wherein the coating takes place by means of plasma polymerization; including the step of employing a water-free process gas which contains at least one substituted hydrocarbon compound with up to a maximum of 8 C-atoms and also an inorganic gas, to produce a coating which is stable in the long term.

22. Process according to claim 21, including employing a gas mixture wherein the proportion of organic compound in the gas mixture is between 5 and 90 volume %.

23. Process according to claim 22, wherein the gas mixture includes an inorganic gas which includes at least one of the following: oxygen, halogen, hydrogen, an inert gas, carbon monoxide, carbon dioxide, nitrogen, and a nitrogen-containing gas.

24. Process according to claim 21, including the step of employing at least one of an aliphatic, aliphatic cyclic, and aromatic hydrocarbon.

25. Process according to claim 21, including the step of employing as an organic compound at least one of the following: a polyene, a monovalent or multivalent alcohol, a monovalent or multivalent carboxylic acid, an ether, an aldehyde, and a ketone.

26. Process according to claim 21, including the step of employing as an organic compound at least one of the following: an alkane, an alkene, and an alkyne.

27. Process according to claim 26, wherein: (1) said alkane is at least one of methane, ethane, propane, butane, pentane and hexane; (2) said alkene is at least one of ethylene, butylene, propylene, and isopropylene; and (3) said alkyne is at least one of acetylene and a derivative of acetylene.

28. Process according to claim 21, including the step of employing as an organic compound at least one of a fluorine-, nitrogen-, and sulphur-substituted hydrocarbon compound.

29. Process according to claim 21, including the step of coating a substrate with 2 to 4 gases of the following: CO₂, CH₄, O₂, C₂H₂, NH₃ and Ar.

E 30. Process according to claim 29, including the step of coating a substrate with a process gas of CO_2 , C_2H_2 and Ar.

31. Process according to claim 30, wherein the volume ratio of CO_2 to C_2H_2 to Ar is 4:1:1.

sub E₂ > 32. Process according to claim 29, including the step of coating a substrate with a process gas of NH_3 , CO_2 , CH_4 and Ar.

contd 33. Process according to claim 32, wherein the volume ratio of NH_3 to CO_2 to CH_4 to Ar is one of 2:1:1:1 and 2:2:1:1.

sub E₃ > 34. Process according to claim 29, including the step of coating a substrate with a process gas of CO_2 and CH_4 .

35. Process according to claim 34, wherein the volume ratio of CO_2 to CH_4 is one of 2:1 and 4:1.

sub E₄ > 36. Process according to claim 29, including the step of coating a substrate with a process gas of CO_2 , CH_4 and Ar.

37. Process according to claim 36, wherein the volume ratio of CO_2 to CH_4 to Ar is one of 3:3:1 and 4:1:1.

E⁵ > 38. Process according to claim 29, including the step of coating a substrate with a process gas of CO₂ and Ar.

39. Process according to claim 38, wherein the volume ratio of CO₂ to Ar is 4:1.

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E₆ > 40. Process according to claim 29, including the step of coating a substrate with a process gas of CH₄, O₂ and Ar.

41. Process according to claim 40, wherein the volume ratio of CH₄ to O₂ to Ar is 1:1:1.

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E₇ > 42. Process according to claim 29, including the step of coating a substrate with a process gas of CO₂, CH₄, O₂ and Ar.

43. Process according to claim 42, wherein the volume ratio of CO₂ to CH₄ to O₂ to Ar is one of 1:2:1:2 and 1:4:1:2.

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E₈ > 44. Process according to claim 29, including the step of coating a substrate with a process gas of CH₄, NH₃ and Ar.

45. Process according to claim 44, wherein the volume ratio of CH₄ to NH₃ to Ar is one of 2:2:1, 1:4:1, and 1:2:1.

46. Process according to claim 21, including the step of providing that the polar coating has an initial surface tension of $< 45 \text{ mN/m}$, which remains unchanged for at least one year.

47. Process according to claim 21, including the step of coating at least one of polymer flexible substrates, polymer substrates reinforced with ceramic fibers, glass fibers, polymer fibers and carbon fibers, and powder- or granulate-formed substrates, and producing one of a polar film and a polar molded body.

48. Process according to claim 21, including the step of coating at least one of packing materials and substrates for adhesion of composite materials.

49. Process according to claim 48, wherein said packing materials consist of at least one of films, bottles and containers.

50. Process according to claim 21, including the step of coating at least one of ceramic and metal substrates.